

Management and Administration of Range Lands in Japan

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BEGINNING with the military occupation of Japan in 1945 a Natural Resources Section of the Army was established in General Headquarters. The purpose of this move was to provide a source of advice to the Supreme Commander of Allied Powers and to the Japanese Government on policies and activities pertaining to agriculture, fisheries, forestry, and mining.

conducted a substantial number of studies in these fields. Specialists or consultants were drawn from the ranks of the military and other Government agencies, from academic and research institutions, and from private industry. One such project, under the general direction of the Forestry Division of Natural Resources, dealt with a study of the native grassland areas of Japan (Fig. 1) and was conducted by the writer April through June of 1951. This paper includes some of the highlights of this study.



FIGURE 1. Famous Mt. Fugi. In the foreground is a view of typical native grasslands, known as "genya."

From the time of the surrender in 1945 to the signing of the peace treaty in 1951, the Section of Natural Resources

The lack of published material (either Japanese or English) on grazing in Japan made it necessary to obtain most of the

information from on-the-ground investigation. This was done through inspection in company with prefectural, national, city, town and village officials and through discussion with farmers who use the lands being inspected.

EXTENT OF GRASSLANDS

Estimates by the Ministry of Agriculture and Forestry place the uncultivated area of Japan suitable for range use at about seven million acres. An accurate usability survey probably would reduce this estimate, since appreciable

the 1931-40 average to 1950 to be as follows:

Dairy cattle from 169,000 to 204,000; draft and beef cattle from 1,542,000 to 2,257,000; sheep from 77,000 to 364,000; goats from 129,000 to 418,000. During this period horses decreased from 1,315,000 to 1,076,000.

In Japan the cow or the horse is kept on the farm primarily for draft purposes. Draft animals become beef only after eight years of labor in the fields and forests and after they have served their usefulness for work (Fig. 2). Milk and

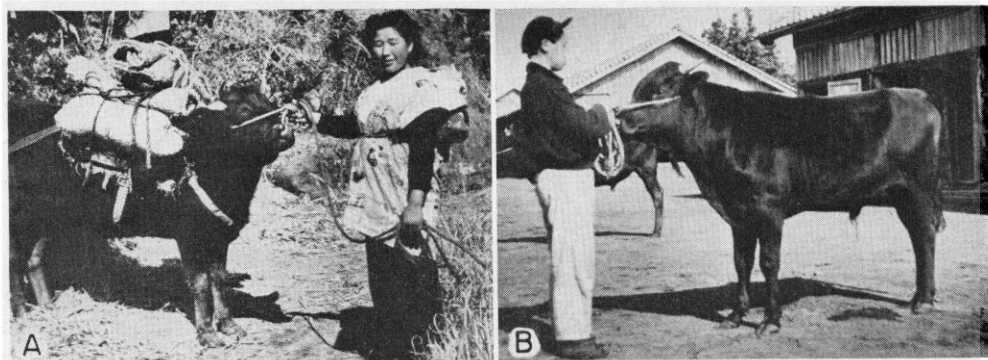


FIGURE 2. DRAFT CATTLE IN JAPAN. A. Work cow laden with purchases made by the Japanese farm wife in the nearest village. B. Two-year old "bungo" type bull. The breed has been fixed for over 500 years—a small compact animal well adapted to pulling a plow in the rice paddies or carrying a pack over rough mountainous terrain.

areas now classified as usable would be excluded because of steep slopes and unstable soils. Best records obtainable at this time indicate that only about 3.5 million acres of the nation's range lands are now in use. About 20 percent of this (mostly national forest) is owned by the national government—about 80 percent by communities and private individuals.

LIVESTOCK POPULATIONS

Livestock on the farms, except horses, has been increasing gradually in recent years. The Ministry of Agriculture and Forestry has reported the increases from

beef are not items of daily diet in the average Japanese home.

DESCRIPTION OF THE RANGE

The range itself can be classified into two broad types—one is the nonforested area where grass or grass-like plants predominate, and the other is a mixture of grass, forest, and brush. For Japan as a whole, and considering the area now used for grazing, the mixed type predominates with a ratio of about four to one.

Bamboo grass (*Sasa* spp. and *Pleio-blastus* spp.) predominates throughout

the Islands and is strongly dominant in Hokkaido. It is commonly found in open areas but most species will thrive in woodland under 30 to 50 percent shade. The most important feature of bamboo grass is its ability to retain protein and palatability well into the season. It is used both for grazing and hay and, although the leaves and stems are somewhat harsh, possesses a fair degree of palatability. Sometimes this species is used for winter grazing (Fig. 3A), par-

common in southern Honshu and Kyushu. It is used for grazing but is harsh and unpalatable. It requires a great deal of sunlight and is found in open areas and on dikes and river beds.

"Toda-shiba" (*Arundinella hirta*) is found throughout Japan in both open and wooded areas but is most common in northern Honshu and Kyushu. It loses palatability after early stages of growth.

"O-garukaya" (*Cymbopogon goeringii*) commonly is found in open areas in



FIGURE 3. NATIVE GRASSES. A. Bamboo grass range, northern Honshu, used for winter grazing. Village and Prefectural (State) officials explain the range management plan for this range. B. "Susuki" cut for fodder September 1950 and photographed March 1951.

ticularly for horses. Other native forage species with the order of importance varying by localities, include:

"Susuki" (*Miscanthus sinensis*) and "kariyasu" (*M. tinctorius*) are distributed widely over nonforested areas and are commonly used for fodder, compost, and thatching. Palatability for grazing use is low except in early stages of growth (Fig. 3B).

"Shiba" (Japanese lawn grass, *Zoysia japonica*) is common in open areas, particularly in Honshu and Kyushu. Palatability is comparatively high throughout the season, and it is easily overgrazed with resulting surface erosion.

"Chi-gaya" (*Imperata cylindrica*) is distributed over all of Japan but is most

Honshu and Kyushu. It is used for grazing and is comparatively palatable. "Hagi" (Japanese bush clover, *Lespedeza bicolor*) is the principal leguminous plant on open native ranges. It is used for both grazing and hay and is quite palatable, before maturity, for all kinds of livestock.

All of these species would be listed as coarse grasses. None of them would carry a high rating for either nutrition or palatability, even when used at the height of nutritional development. At the same time most of them are capable of sustaining grazing animals on a maintenance ration throughout the summer season.

USE AND MANAGEMENT

Native range is subject to two principal types of use: (a) grazing where the animals run at large and (b) cutting for hay or compost where the product is transported from the range to the place of use. Sometimes the same area serves both purposes. Open grazing is practiced most widely in northern Honshu and Hokkaido. Further south the major use of grass land is for cut fodder and compost. Grass is also used for thatching material throughout the islands.

Accurate figures on the area used for grass cutting as opposed to grazing are not available but estimates by the Ministry of Agriculture and Forestry indicate that, exclusive of Hokkaido, about 55 percent of the use of range lands is for cut fodder or compost. In Hokkaido about 15 percent of the area is thus used. Important problems relating to this form of use include transportation from the range to the place of use, drying or curing the product after cutting, and the effect of cutting on future productivity of the grass.

Where grazing is practiced the methods of management compare favorably with those on the best-handled range lands in the United States. More by chance than by design, those who manage the grazing areas show fair adherence to the requirements of proper numbers of livestock, proper seasons of grazing, and proper handling of the livestock on the range. Not much overgrazing occurs because in general the available supply of forage is substantially in excess of the demand for grazing and the range is not readily accessible to the farm holdings.

Most of the grazing lands inspected are managed by village cooperatives, and the individual members are assessed their *pro rata* share for running expenses, including hiring of caretakers, and such

maintenance and construction work as limited budgets will allow. This form of management is common throughout Japan where the range is held in communal ownership.

Seasons of use generally are from May to October although some winter grazing is practiced in Hokkaido. In some places, too early use was causing damage to soil and vegetation, but over the country as a whole there appeared to be good compliance with the requirements of proper seasonal use.

Conversion of native grasslands to improved pastures through planting of introduced species would greatly increase the forage value. But how to accomplish this on the relatively remote and inaccessible back-country ranges presents problems for which no immediate solution is available. The land is already covered with a dense growth of grass and shrubs which would have to be removed as a first step in soil preparation. The cost of removal, measured in terms of either heavy equipment or hand labor, would be excessive. Following planting, extremely heavy maintenance would be required to keep out competing vegetation. Information on what, when, where, and how to plant is almost totally lacking. Under prevailing circumstances and conditions, artificial revegetation is not a practical possibility on high native range lands.

A great amount of labor is involved in harvesting and transportation. Cutting is done by hand with a short knife or sickle. The cut grass is transported to the farm house by various methods, including packing by man or beast, or hauling with cart or truck. Where the demand for fodder and compost is heavy the cutting area frequently is located a long distance from the place of use. Several instances were encountered where a day was re-

quired for one round trip to bring out a pack load (200 pounds by horse or cow and 100 pounds by man) of cut fodder.

Only rarely is the cutting area on native grassland close enough to the farm to provide fresh grass for daily use. For this reason most of the fresh-cut fodder during the growing season is obtained from the field and paddy borders, dikes, and small uncultivated corners.

In every case covered by this study, forage cut for winter feeding was harvested long after optimum development. Native grass is relatively low in feed value even when harvested at the most favorable stage of growth. When harvested at or after full maturity, as it is throughout all of Honshu and Kyushu, the resulting product is low in both palatability and nutrition and is barely capable of sustaining animals throughout the winter without supplemental feeding. As practiced now, cutting operations begin in August or September, more than two months after the period of full development.

Range users interviewed gave two reasons for delayed cutting. One is that the proper date of harvesting conflicts with the heavy spring work period on the farms when labor cannot be spared for grass cutting work. The other is that heavy rains and high humidity prevailing in the spring of the year make it impossible to cure cut grass without spoilage from mildew. The latter reason is regarded as the more valid; herein lies the biggest single obstacle to realizing full value from the native forage of Japan. In addition it imposes some very real limitations, not fully recognized by agricultural officials but none the less definite, against future expansion in number of livestock dependent on stored native forage in southern Japan.

EFFECTS OF USE

Generally speaking, the present intensity of grazing use on the areas inspected is not having an adverse effect on the soil or forage. Devastation by grazing animals in the sense of destroying all cover and exposing the soil to erosion, a condition found in many parts of the world, does not exist in Japan. Gully erosion as a result of grazing is rare. Three important factors are responsible for this situation. The supply of forage is in excess of the demand; the forage is not attractive because of its low value; and rapid growth of the vegetation, approaching jungle conditions, is effective in healing grazing scars.

On the areas inspected the currently light grazing use is not causing excessive damage to hardwood forests. Full utilization of the forage in such areas would cause damage because grazing and hardwood forestry are not compatible. For this reason range management plans should exclude grazing use of areas where the primary aim is production of hardwood forests. Excessively steep nontimbered slopes, now grazed, should be converted to forests. In tree planting programs where there is local need for grazing, relatively level and accessible areas should be left unplanted.

RANGE IMPROVEMENTS

The principal improvement structures consist of boundary and compartment fences, access roads and trails, stock watering facilities, association headquarters buildings, shelters for caretakers, and limited amounts of clearing to remove undesirable shrubs which interfere with grasscutting operations. Most of the existing improvements are in a bad state of repair and no longer serve the purpose for which constructed. They were installed in the first place largely

through subsidies granted by the national government and under the pressure of need to provide more horses for military use. When the subsidies were discontinued and the need for increased numbers of horses no longer existed maintenance of the improvements stopped. This is particularly true of boundary and compartment fences.

At least 90 percent of the fences seen consisted of earthen embankments (Fig. 4), generally topped with one or two



FIGURE 4. Newly constructed division fence on a native grassland range in Iwate Prefecture, Japan.

strands of barbed wire. The initial cost of construction is heavy, and deterioration through weathering and erosion is rapid. Without maintenance this type of fence loses its effectiveness five years following construction. Despite its cost, this type of fence is more economical than post and wire construction, especially in southern Japan where post wood material is scarce.

ADMINISTRATION OF RANGE LANDS IN THE NATIONAL FORESTS

On national forests the line of responsibility extends from the Director of the Forestry Agency through the Regional Forester and District Foresters (Forest Supervisors) to the Forest Rangers. Action with respect to use of the range begins with submission of an application from an individual or an association to the District Forester. The application must be accompanied by a "management plan" outlining in some detail the manner in which the forage is to be used and includes such items as number and kinds of livestock, time of grazing, method of handling, and matters pertaining to construction and maintenance of improvements. After receipt of the application the District Forester or his representative (sometimes the Ranger) makes a survey of the area applied for and, if the proposed management plan is satisfactory and the area is less than 12.5 acres, the District Forester may then issue a permit for not to exceed five years. The fee must be paid within 10 days following issuance of the permit. The amount of the fee is linked with the assessed valuation of the land.

If the land applied for exceeds 12.5 acres the District Forester forwards all the papers to the Regional Forester who checks for compliance with general policy and management procedures, and then approves or disapproves issuance of permit by the District Forester.

Range management plans theoretically are prepared as a part of and included in timber management plans put out by the Regional Forester. For this reason the plans cover only broad principles of management and contractual requirements designed to apply to any national forest range area. The detailed prescription for management originates with the applicant.

District Rangers exercise general police powers but have little influence in management or administration of the range. They have been very effective in keeping fire out of national forest range lands.

RANGE GUIDANCE ON PRIVATELY OWNED LANDS

Administrative matters pertaining to the handling of privately owned pasture lands are under the general direction of the Chief of Diversified Farm Section in the Livestock Bureau. Under him is the Chief of Pasture Land Branch who directs the pasture activities of four subsections dealing with specified lines of work.

The personnel of the Pasture Land Branch includes only seven trained pasture specialists, but expansion to 18 is being recommended by the chief of that branch so as to meet the needs for work in the fields of erosion control, livestock feeds, and forestry. The personnel of this branch work in close cooperation with extension and research people in the Agricultural Improvement Bureau.

The foregoing outlines the national government organization responsible for guidance and leadership in the handling of privately owned range lands. At the prefectural level this responsibility is carried by the Chief of the prefectural Livestock Section. Altogether the prefectures now employ about 60 men who specialize in range work. Most of them are not specially trained, but some have had enough experience to qualify as specialists.

RANGE RESEARCH

Range research work on national forests is under the general direction of the Forestry Agency, extending through the Chief of the Forest Experiment Station to such technicians as may be assigned to the Takahagi Experimental

Site of the Forest Experiment Station at Uwadai, Ibaraki Prefecture, and to the Sapporo Branch Forest Experiment Station in Hokkaido.

Most of the research work pertaining directly to forage and range problems on privately owned land is under the general direction of the Agricultural Improvement Bureau in the Ministry of Agriculture and Forestry. From this bureau the lines of authority extend through the Research Department, Agricultural Technique Institute, and five agricultural experiment stations to sections, subsections, and laboratories under each covering such activities as general guidance of programs, farm management, livestock, land utilization, pastures, and feed and forage crops.

National and prefectural officials handling both research and administrative pasture work were well informed about the results of experiments with various plants under nursery conditions. At the same time some of them seemed not fully to appreciate the need for more projects of a practical nature. Nursery trials are being conducted to determine the response of various forage plants to reseeding, but little or no work has been done to extend these trials to field conditions. On most range inspected the local officials were proposing to improve the range through introduction of new species but had no information concerning the likelihood of success of such programs.

Lack of finances prohibits adequate staffing in most lines of research work, and such funds as are available usually are allotted to projects other than range. At the Hokkaido Agricultural Experiment Station, for example, of 21 scheduled projects (most of them in the planning stage only) only three dealt with range and pasture problems. One (laboratory only) covered nutritive value of wild

grasses, one covered pasture management, and the third dealt with improvement and utilization of range. Out of 37 technicians and technical assistants, only four had any connection with range projects. The five agricultural experiment stations carry only three pasture specialists. Planned range and pasture experiments at Takahagi Branch Forest Experiment Station are making little headway because of lack of funds. Among experiments planned are such projects as cultivation of lespedeza, development of woodland pasture, testing various species of shelter trees, effect of thinning tree growth on grass production, and demonstration plots of forage plants.

From the brief contacts made, together with information supplied by national and prefectural officials, it appeared that forage and range research had not made much progress in Japan.

GRAZING LEGISLATION

In 1950 the Diet enacted a new pasture law, the purpose of which, as outlined in Chapter 1 of the law, was to obtain conservation of pasture land through protection, development, and proper management. It abolishes an earlier law enacted in 1931. It also dissolves all pasture land associations and cooperatives organized under the old law and provides for organization of new ones under a specific ordinance governing such organizations.

The new law applies to all range lands not in national ownership. Chapter 2 outlines the procedures under which pasture owners may apply for and receive technical guidance and financial assistance in improved pasture management. Chapter 3 carries provisions for enforcement of rules designed to stop destructive use of land or forage.

Application for recognition under the law is strictly voluntary. Responsibility for development of management features

rests with the owner of the land who submits his proposed plan of management along with the application for recognition. In the case of prefectural lands the proposed regulations are approved or disapproved by the Minister of Agriculture and Forestry; in the case of communally owned lands approval action is by the governor of the prefecture. Only the governor of the prefecture can take direct action under Chapter 3 to stop destructive use.

The new law has not been in effect long enough to test its value or to enable results to be judged. Basically it is a good law because it provides for protection and development of an important part of Japan's range lands. In addition it contains both a statement of purpose and expression of policy. It assigns administrative authority to the prefecture and the national government, subject to ministerial ordinance, for carrying out the purposes of the law. In these respects Japan's pasture legislation is far ahead of that of most other countries.

The weaknesses of the law lie in the fact that: (a) responsibility for initiating proper management rests wholly with the owner of the land; (b) prefectural governors exercise a disproportionate amount of authority in passing on the adequacy of proposal regulations; and (c) the central government cannot initiate direct action under Chapter 3 to stop destructive use.

Under the provisions of the present law covering national forests, the Forestry Agency in the Ministry of Agriculture and Forestry has full authority and responsibility for protection, development, and administration of forage-producing land in the national forests.

Under the provisions of legislation known as the "Owner-Farmer Established Law," national forest land which is used primarily for pasture and which

has a tree cover of less than 30 percent is classified as pasture land and subject to transfer to farmers. If the land is used primarily for reforestation it is classified as forest land and is not subject to transfer. Such transfers, after joint survey and agreement between the Forestry Agency and prefectures are now being made.

ROLE OF GRASS IN PREVENTING FLOODS AND EROSION

Any summary of the range land situa-

tion in Japan would be incomplete without special emphasis on the value of native grasses in helping to prevent floods and erosion. Their function in this field far exceeds that of producing forage for livestock or compost for paddies. Therefore it behooves the Japanese people to see to it that native grass lands are protected always against deterioration. If they succeed in this they will have accomplished more than many other nations, including the United States.



ONE WORLD

All the trends of our day are toward the unification of our world, whether we like it or not. We are already one world economically. We are one in a physical sense, considering the speed of travel and communication. But unfortunately the world is divided into a thousand parts, and particularly into two great parts, intellectually and morally. That is the essence of our modern problem. It is a new kind of problem. But it is perfectly soluble. It is time for all free nations to agree on a program for peace, and to cooperate whole-heartedly and unselfishly in the achievement of that program.—*Milton S. Eisenhower*, *Agronomy Journal*, December 1951.